

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT(S)' INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

ATTY. DOCKET NO.

23623-7078

SERIAL NO.

Not Assigned

INVENTOR

Davis et al.

FILING DATE

~~Herewith~~

GROUP ART UNIT

~~Not Assigned~~

Jc872 U.S. PTO

10/075907



REFERENCE DESIGNATION

U.S. PATENT DOCUMENTS

EXAM'R INITIAL		DOCUMENT NUMBER	DATE	NAME	Class	Subclass	Filing Date If Appropriate
ES	*A1	5,208,158	05/04/93	Bech et al.			
	*A2	5,244,791	09/14/93	Estell			
	*A3	5,316,935	05/31/94	Arnold et al.			
	*A4	5,316,941	05/31/94	Estell et al.			
	*A5	5,403,737	04/04/95	Abrahmsen et al.			
	*A6	5,629,173	05/13/97	Abrahmsen et al.			

FOREIGN PATENT DOCUMENTS

EXAM'R INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	Subclass	TRANSLAT'N
ES	*B1	WO 91/16423	04/18/91	PCT	✓	—	yes
ES	*B2	WO 96/27671	02/27/96	PCT	—	—	yes
ES	*B3	EP 3 328 229 A1	08/1989	EP	—	—	yes
ES	*B4	WO 97/37007	10/09/97	PCT	—	—	yes
ES	*B5	WO 98/23732	06/04/98	PCT	—	—	yes

OTHER ART (Include Author, Title, Date, Pertinent Pages, etc.)

ES	*C1	Akabas et al., "Acetylcholine Receptor Channel Structure Probed in Cysteine- Substitution Mutants," <u>Science</u> , 258:307-310 (1992)
	*C2	Alvear et al., "Inactivation of Chicken Liver Mevalonate 5-Diphosphate Decarboxylase by Sulfhydryl-Directed Reagents: Evidence of a Functional Dithiol," <u>Biochimica et Biophysica Acta</u> , 994:7-11 (1989)
	*C3	Bech, et al., "Chemical modifications of a cysteinyl residue introduced in the binding site of carboxypeptidase y by site-directed mutagenesis," <u>Carlsberg Res. commun.</u> , 53:381-393 (1988)
	*C4	Bech et al., "Significance of Hydrophobic S ₄ -P ₄ Interactions in Subtilisin 309 from <i>Bacillus Lentus</i> ," <u>Biochemistry</u> , 32:2847-2852 (1993)
	*C5	Bell et al., "Kinetic Studies on the Peroxidase Activity of Selenosubtilisin," <u>Biochemistry</u> , 32:3754-3762 (1993)
	*C6	Berglund et al., "Chemical Modification of Cysteine Mutants of Subtilisin <i>Bacillus Lentus</i> Can Create Better Catalysts Than The Wild-Type Enzyme," <u>J. Am. Chem. Soc.</u> , 119:5265-5266 (1997)
	*C7	Berglund, et al., Altering the specificity of subtilisin B. <i>Lentus</i> by combining site-directed mutagenesis and chemical modification," <u>Bioorganic & Medicinal Chemistry Letters</u> , 6:2507-2512 (1996)
	*C8	Bodwell et al., "Sulfhydryl-Modifying Reagents Reversibly Inhibit Binding of Glucocorticoid-Receptor Complexes to DNA-Cellulose," <u>Biochemistry</u> , 23:1392-1398 (1984)
	*C9	Bonneau et al., "Alteration of the Specificity of Subtilisin BPN' by Site Directed Mutagenesis in Its S ₁ and S ₁ ' Binding Sites," <u>J. Am. Chem. Soc.</u> , 113:1026-1030 (1991)
	*C10	Brocklehurst, "Specific Covalent Modification of Thiols: Applications in the Study of Enzymes and Other Biomolecules," <u>Int. J. Biochem.</u> , 10:259-274 (1979)
ES	*C11	Bruice et al., "Novel Alkyl Alkanethiolsulfonate Sulfhydryl Reagents. Modification of Derivatives of L-Cysteine," <u>Journal of Protein Chemistry</u> , 1:47-58 (1982)

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S. S. Bodysky

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82	*C12	Buckwalter, et al., "Improvement in the Solution Stability of Porcine Somatotropin by Chemical Modification of Cysteine Residues," <u>J. Agric. Food Chem.</u> , 40:356-362 (1992)
	*C13	Daly et al., "Formation of Mixed Disulfide Adducts at Cysteine-281 of the Lactose Repressor Protein Affects Operator And Inducer Binding Parameters," <u>Biochemistry</u> , 25:5468-5474 (1986)
	*C14	Davies et al., "A Semisynthetic Metalloenzyme Based on a Protein Cavity That Catalyzes the Enantioselective Hydrolysis of Ester and Amide Substrates," <u>J. Am. Chem. Soc.</u> , 119:11643-11652 (1997)
	**C15	Davis, B.G., et al., "Altering the specificity of subtilisin Bacillus lentus through the introduction of positive charge at single amino acid sites," <u>Bioorganic and Medicinal Chemistry</u> , (1999 Nov.) 7(11) 2303-11, XPO000892841
	**C16	Davis, B.G., et al., "The controlled introduction of multiple negative charge at single amino acid sites in subtilisin bacillus lentus," <u>Bioorganic and Medicinal Chemistry</u> , (1999 Nov.) 7(11) 2293-301, XPO000892840.
	**C17	Desantis, G., et al., "Probing the altered specificity and catalytic properties of mutant subtilisin chemically modified at position S156C and S166C in the S1 pocket," <u>Bioorganic and Medicinal Chemistry</u> , (1999) 7/7 (1381-1387), XP0000892843
	*C18	Desantis, G., et al., "Chemical Modifications at a single site can induce significant shifts in the pH profiles of a serine protease," <u>J. Am. Chem. Soc.</u> , 120:8582-8586 (1998)
	*C19	Desantis, G., et al., "Site-Directed Mutagenesis combined with chemical modification as a strategy for altering the specificity of the S1 and S1' pockets of subtilisin bacillus lentus," <u>Biochemistry</u> , 37: 5968:5973 (1998)
	*C20	Di Bello, "Total Synthesis of Proteins by Chemical Methods: The Horse Heart Cytochrome C Example," <u>Gazzetta Chimica Italiana</u> , 126:189-197 (1996)
	**C21	Dickman, M., et al., "Chemically modified mutants of subtilisin bacillus lentus catalyze transesterification reactions better than wild type," <u>Tetrahedron Asymmetry</u> , (11. Dec. 1998) 9/23 4099-4102, XPO000891276.
	*C22	Engler et al., "Critical Functional Requirement for the Guanidinium Group of the Arginine 41 Side Chain of Human Epidermal Growth Factor as Revealed by Mutagenic Inactivation and Chemical Reactivation," <u>The Journal of Biological Chemistry</u> , 267:2274-2281 (1992)
	*C23	Frillingos, et al., "Cysteine-Scanning Mutagenesis of Helix II and Flanking Hydrophilic Domains in the Lactose Permease of <i>Escherichia coli</i> ," <u>Biochemistry</u> , 36:269-273 (1997)
	*C24	Gloss et al., "Examining the Structural and Chemical Flexibility of the Active Site Base, Lys-258, of <i>Escherichia coli</i> Aspartate Aminotransferase by Replacement with Unnatural Amino Acids," <u>Biochemistry</u> , 34: 12323-12332 (1995)
	*C25	Gron et al., "A Highly Active and Oxidation-Resistant Subtilisin-Like Enzyme Produced by a Combination of Site-Directed Mutagenesis and Chemical Modification," <u>Eur. J. Biochem.</u> , 194:897-901 (1990)
	*C26	Hempel et al., "Selective Chemical Modification of Human Liver Aldehyde Dehydrogenases E ₁ and E ₂ by Iodoacetamide," <u>The Journal of Biological Chemistry</u> , 256:10889-10896 (1981)
82	*C27	Hilvert et al., "A Highly Active Thermophilic Semisynthetic Flavoenzyme," <u>J. Am. Chem. Soc.</u> , 110:682-689 (1988)

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88	*C28	Hilvert et al., "New Semisynthetic Flavoenzymes Based on a Tetrameric Protein Template, Glyceraldehyde-3-Phosphate Dehydrogenase," <i>J. Am. Chem. Soc.</i> , 107:5805-5806 (1985)
	*C29	House et al., " ¹ H NMR Spectroscopic Studies of Selenosubtilisin," <i>Biochemistry</i> , 32:3468-3473 (1993)
	*C30	Huang et al., "Improving the Activity of Immobilized Subtilisin by Site-Specific Attachment to Surfaces," <i>Anal. Chem.</i> , 69:4601-4607 (1997)
	*C31	International Search Report, mailed July 21, 2000, Corresponding PCT US99/30362
	*C32	Kaiser, "Catalytic Activity of Enzymes Altered at Their Active Sites," <i>Angew. Chem. Int. Ed. Engl.</i> , 27:913-922 (1988)
	*C33	Kanaya et al., "Role of Cysteine Residues in Ribonuclease H from <i>Escherichia coli</i> ," <i>Biochem. J.</i> , 271:59-66 (1990)
	*C34	Kawase et al., "Effect of Chemical Modification of Tyrosine Residues on Activities of Bacterial Lipase," <i>Journal of Fermentation and Bioengineering</i> , 72:317-319 (1991)
	*C35	Kenyon, et al., "Novel Sulfhydryl Reagents," <i>Methods Enzymol.</i> , 47:407-430 (1977)
	*C36	Kirley, "Reduction and Fluorescent Labeling of Cyst(e)ine-Containing Proteins for Subsequent Structure Analyses," <i>Analytical Biochemistry</i> , 180:231-236 (1989)
	*C37	Kluger et al., "Amino Group Reactions of the Sulfhydryl Reagent Methyl Methanesulfonothioate. Inactivation of D-3-hydroxybutyrate Dehydrogenase and Reaction with Amines in Water," <i>Can. J. Biochem.</i> , 58:629-632 (1980)
	*C38	Kokubo et al., "Flavohemoglobin: A Semisynthetic Hydroxylase Acting in the Absence of Reductase," <i>J. Am. Chem. Soc.</i> , 109:606-607 (1987)
	*C39	Konigsberg, "Reduction of Disulfide Bonds in Proteins with Dithiothreitol," <i>Methods in Enzymology</i> , 25:185-188 (1972)
	*C40	Kuang et al., "Enantioselective Reductive Amination of α -Amino Acids by a Pyridoxamine Cofactor in A Protein Cavity," <i>J. Am. Chem. Soc.</i> , 118:10702-10706 (1996)
	*C41	Lewis et al., "Determination of Interactive Thiol Ionizations in Bovine Serum Albumin, Glutathione, and Other Thiols by Potentiometric Difference Titration," <i>Biochemistry</i> , 19:6129-6137 (1980)
	*C42	Liu et al., "Site-Directed Fluorescence Labeling of P-Glycoprotein on Cysteine Residues in the Nucleotide Binding Domains," <i>Biochemistry</i> , 35:11865-11873 (1996)
	*C43	Miller et al., "Peroxide Modifications of Monoalkylated Glutathione Reductase," <i>The Journal of Biological Chemistry</i> , 266:19352-19350 (1991)
	*C44	Nakayama et al., "Chemical Modification of Cysteinyl, Lysyl and Histidyl Residues of Mouse Liver 17 β -Hydroxysteroid Dehydrogenase," <i>Biochimica et Biophysica Acta</i> , 1120:144-150 (1992)
	*C45	Nishimura et al., "Reversible Modification of the Sulfhydryl Groups of <i>Escherichia coli</i> Succinic Thiokinase with Methanethiolating Reagents, 5,5'-Dithio-bis(2-Nitrobenzoic Acid), p-Hydroxymercuribenzoate, and Ethylmercurithiosalicylate," <i>Archives of Biochemistry and Biophysics</i> , 170:461-467 (1975)
	*C46	O'Connor et al., "Probing an Acyl Enzyme of Selenosubtilisin by Raman Spectroscopy," <i>J. Am. Chem. Soc.</i> , 118:239-240 (1996)
88	*C47	Pardo et al., "Cysteine 532 and Cysteine 545 Are the N-Ethylmaleimide-Reactive Residues of the <i>Neurospora</i> Plasma Membrane H ⁺ -ATPase," <i>The Journal of Biological Chemistry</i> , 264:9373-9379 (1989)

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SD	*C67	Soper et al., "Effects of Substrates on the Selective Modification of the Cysteinyl Residues of D-Amino Acid Transaminase," <u>The Journal of Biological Chemistry</u> , 254:10901-10905 (1979)
	*C68	Stauffer, et al., "Electrostatic Potential of the Acetylcholine Binding Sites in the Nicotinic Receptor Probed by Reactions Of Binding-Site Cysteines with Charged Methanethiosulfonates," <u>Biochemistry</u> , 33:6840-6849 (1994)
	*C69	Stewart et al., "Catalytic Oxidation of Dithiols by a Semisynthetic Enzyme," <u>J. Am. Chem. Soc.</u> , 108:3480-3483 (1986)
	*C70	Suckling et al., "Carbon-Carbon Bond Formation Mediated by Papain Chemically Modified by Thiazolium Salts," <u>Bioorganic & Medicinal Chemistry Letters</u> , 3:531-534 (1993)
	*C71	Svensson et al., "Mapping the Folding Intermediate of Human Carbonic Anhydrase II. Probing Substructure by Chemical Reactivity and Spin and Fluorescence Labeling of Engineered Cysteine Residues," <u>Biochemistry</u> , 34:8606-8620 (1995)
	*C72	Valenzuela et al., "Kinetic Properties of Succinylated and Ethylenediamine-Amidated 8-Chymotrypsins," <u>Biochim. Biophys. Acta</u> , 250:538-548 (1971)
	*C73	West et al., "Enzymes as Synthetic Catalysts: Mechanistic and Active-Site Considerations of Natural and Modified Chymotrypsin," <u>J. Am. Chem. Soc.</u> , 112:5313-5320 (1990)
	*C74	White et al., "Sequential Site-Directed Mutagenesis and Chemical Modification to Convert the Active Site Arginine 292 Of Aspartate Aminotransferase to Homoarginine," <u>Journal of the American Chemical Society</u> , 114:292-293 (1992)
	*C75	Worku et al., "Identification of Histidyl and Cysteinyl Residues Essential for Catalysis by 5'-Nucleotidase, <u>FEBS Letters</u> , 167:235-240 (1984)
	*C76	Wu et al., "Conversion of a Protease into an Acyl Transferase: Selenolsubtilisin," <u>J. Am. Chem. Soc.</u> , 111:4514-4515 (1989)
	*C77	Wynn et al., "Comparison of Straight Chain and Cyclic Unnatural Amino Acids Embedded in the Core of Staphylococcal Nuclease," <u>Protein Science</u> , 6:1621-1626 (1997)
	*C78	Wynn et al., "Mobile Unnatural Amino Acid Side Chains in the Core of Staphylococcal Nuclease," <u>Protein Science</u> , 5:1026-1031 (1996)
	*C79	Wynn et al., "Unnatural Amino Acid Packing Mutants of <i>Escherichia Coli</i> Thioredoxin Produced by Combined Mutagenesis/Chemical Modification Techniques," <u>Protein Science</u> , 2:395-403 (1993)
	*C80	Wynn et al., "Chemical modification of Protein Thiols: Formation of Mixed Disulfides," <u>Methods in Enzymology</u> , 251:351-356 (1995)
SD	*C81	Xu et al., "Amino Acids Lining the Channel of the γ -Aminobutyric Acid Type A Receptor Identified by Cysteine Substitution," <u>The Journal of Biological Chemistry</u> , 268:21505-21508 (1993)

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